11. Household Hazardous, Specialty, and Electronic Waste

11.1 Purpose

This chapter reviews the need for programs related to household hazardous waste (HHW), electronic waste, and sharps collection. It reviews the current legislative activity regarding these categories of waste and what the County said about them in its previous ISWMP. Current County programs will be described and compared to programs in other jurisdictions.

New goals and strategies for the County and the tactics to achieve these goals are addressed. Finally, an implementation timeline is provided at the end of this chapter.

11.2 Legislative Background

11.2.1 Federal

- HHW is exempt from regulations as a hazardous waste under the Resource Conservation and Recovery Act (RCRA) rules of the Code of Federal Regulations (40 CFR Part 261.4).

- Conditionally Exempt Small Quantity Generators (CESQGs). The federal government exempts CESQG generators of 220 pounds or less in a calendar month from obtaining an EPA identification numbers. This exempts those generators from much more stringent and costly guidelines (40 CFR 261.5).

- Universal and Special Waste. Federal universal waste regulations began in 1995 and are found in Title 40, Code of Federal Regulations 273 that list batteries, pesticides, mercury-containing equipment, and lamps. These are less stringent than RCRA and allow for the creation of standards that are different. However, with regard to batteries, the regulation demands the phasing out of mercury in batteries, implements a uniform labeling on batteries, and encourages recycling of used nickel-cadmium, small sealed lead-acid batteries (Public Law 104-142 May 13, 1996).

11.2.2 State of Hawaii

- The State of Hawaii's rules (HAR 11-273-5) list the same items as the federal government with more stringent requirements on lamps containing lead and mercury.

- The Hawaii Administrative Rules (HAR), Title 11, Department of Health Chapter 261 exempts household hazardous waste from the hazardous waste regulations. Lead-acid batteries are further regulated through HRS 342I.

- The State of Hawaii also exempts CESQGs under HAR 11-261-5.

- During the 2008 Legislature, an electronic waste bill was passed into law. Act 13 of the 2008 Special Session requires manufacturers of computers, computer printers and computer monitors to establish recycling programs for their products.

11.3 Review of 1994 ISWMP

In the June 1994 ISWMP, the County's objectives (8-3) for HHW were as follows:

- To promote reduction, reuse and recycling, detoxification, treatment or destruction, and proper disposal of HHW;
- Assure operational and cost flexibility in the HHW collection program to address changing requirements or needs within the County;
- Improve opportunities to more cost-effectively manage HHW; and
- Encourage citizens to take an active role in helping the County reduce the quantities of toxic material that require disposal.

The 1994 ISWMP also addressed automobile batteries through the State's take-back program. This is a regulatory requirement that retailers must accept, at a minimum, the same number of lead acid batteries for recycling as they sell.[1] This is a form, generally speaking, of product stewardship. Household batteries, however, were "not the focus of this [1994] discussion." (7.6.1)

The 1994 ISWMP discussed the State's 1991 regulation (Act No. 200) which prohibits all motor oil from being placed in "sewers, drainage systems, surface or ground waters, watercourses or marine waters, or onto the ground." (7.5.1) The plan set, as a goal, the continuation to promote used oil collection, establish used oil collection points on Molokai and Lanai, and provide technical assistance to farmers, boat owners and other parties within Maui County.

Electronic and other special waste were not discussed in the 1994 ISWMP.

11.4 Implementation of 1994 ISWMP

Starting in 1988, the State has held HHW collection events through its contractor EnviroServices. Contrary to the direction of the 1994 ISWMP, the State stopped holding HHW collection events as of 2000.

The County, however, has diligently followed other aspects of its 1994 ISWMP by implementing reuse programs for both latex paint and electronic waste.

The County has provided public drop-off sites for used motor oil at some of its own facilities. The oil must be generated by home mechanics only, be drained from cars and trucks, and not be mixed with other fluids. This oil is collected at the Central Maui Landfill seven days a week, the Olowalu Recycling & Refuse Convenience Center seven days a week, the Hana Landfill six days a week, and at the County's Molokai Landfill

[1] County of Maui ISWMP, Section 7, page 20, item 7.6.1; HRS Chapter 342I; http://hawaii.gov/health/environmental/waste/sw/pdf/oldcbats.pdf fact sheet on lead acid batteries.

seven days a week. The County has also partnered with nine private entities where the public can take its used motor oil.

The County has partnered with non-profit groups, such as Community Work Day and Habitat for Humanity, to undertake the CompuSwap program.[2] During these two day events, the public can bring their own broken, obsolete or working electronics (e.g., televisions, DVD players, stereos, computers, and printers) to a single-day event, days designated per business and resident customers, and drop them off to volunteers who then either place them into overseas containers for shipment to the mainland or direct the electronics over to a separate group of volunteers to see if the computer can be donated to programs for reuse in the County. The County recently expanded the event-based collection, now called E-cycling, to include acceptance of any electronic systems with a circuit board, such as televisions, stereos, anything attaching to those items, copiers, fax machines, POS systems, and cell phones.

The County also promotes the reuse of latex and oil-based paints by educating citizens that they can take their latex paint to Community Work Day (CWD) Program or Habitat for Humanity for reuse. The public is instructed to call first. For paint that cannot be reused, the County educates people to solidify it by mixing it with an absorbent, such as Kitty Litter, that will make it inert, place it in a triple thick garbage bag and deposit it in the landfill. CWD also provides solidification for small quantities of HHW that are brought to the site.

The County has a de facto program on Molokai where citizens can bring their latex and oil based paints and have it soaked up and dried in old mattresses before the mattresses are placed into the landfill. There is also a reuse swap shop located at the landfill with HHW items sometimes placed among the furniture and other items placed in the facility.

11.5 Generation Rates

11.5.1 HHW

Determining a generation rate for HHW material is problematic because people have a tendency to store this material for years before discarding it into the waste stream. Nationally, HHW in the waste stream ranges from 0.1 to 1.0 percent by weight per year.[3] The 1994 waste stream composition study at the Central Maui Landfill places the figure also at 1 percent.

Nationally, generation estimates have been at four pounds per person per year. However, in 2006, the County of Kauai, estimated its generation of HHW material to be 9.25 pounds per person per year. Using these generation rates provides a range of projected HHW for the County of Maui in 2010 between 300 and 700 tons generated. Some potential HHW materials, such as used motor oil and vehicle batteries, are being recycled.

[2] Community Work Day has over 2,000 volunteers for a host of environmental and community beneficial activities. http://www.hear.org/volunteer/maui/cwd.htm

[3] http://www.epa.gov/reg5rcra/wptdiv/p2pages/hhw.pdf; http://www.epa.gov/superfund/students/clas_act/haz-ed/ff_07.htm

11.5.2 Electronics

Electronic products grow in number every year. The National Safety Council estimated that more than 300 million computers alone became obsolete in the U.S. in 2004. The Electronic Industries Alliance estimates that the average U.S. citizen produces 2.5 pounds of used monitors, TVs, cell phones, chargers, and CPUs annually.

11.6 Background

11.6.1 HHW

HHW operations are expensive on a per-unit basis, such as cost per pound, compared to other activities in waste management. There are some possibilities for revenue from the sale of collected material, but they are limited; there also may be reuse outlets for material collected, but this would be for a fraction of the total collected. A jurisdiction enters into the HHW collection because the material needs to be handled in an environmentally safe manner.

The days have passed when it was acceptable to drain the oil from one's car and dump it onto a shrub one wanted dead. Emptying oil-based paint onto the ground or pouring it into landfills has proven too hazardous to our groundwater and too costly to treat years down the road. HHW can also be ignitable (e.g., household cleaners), corrosive (e.g., automotive batteries), reactive (e.g., explosion when combined with ignitable source), and toxic (e.g., oil-based paint). Individuals generate an estimated average of four pounds a year of this material, nationally, adding up to 530,000 tons annually. When this material collects and mixes in the compactor of a trash truck, fires can ignite, causing harm to the workers and pedestrians, as well as damage to the equipment. These materials can contaminate septic tanks and wastewater treatment systems if poured down the toilet. If leaked into storm drains or allowed to migrate out of landfill cells, they can contaminate the wildlife, drinking water, and the ocean.

11.6.2 Exempt Generators

Local governments have latitude in the type of programs implemented and materials collected because HHW is exempt from the rigorous hazardous waste rules and regulations. Jurisdictions can also collect hazardous material from two types of generators that the USEPA has exempted from certain regulations. Termed conditionally exempt hazardous waste generators (less than 220 pounds of hazardous material generated per month) and small quantity hazardous waste generators (220 to 2,200 pounds) these two groups have been provided dispensation from certain regulations so as to encourage the proper disposal of potentially harmful material.

The fact that these generators are exempt from hazardous regulations does not alter the following points that jurisdictions need to consider before deciding upon how to collect this category of material.

1. When a local jurisdiction collects HHW from households and then releases the material for bulk transportation, that jurisdiction becomes a hazardous waste generator subject to hazardous waste management regulations.

2. Bulked hazardous waste, regardless of its source, must be transported and managed by a regulated hazardous waste transporter and management facility,

which means it must be manifested with a chain of custody and handled by certified employees.

3. If a jurisdiction receives material from conditionally exempt and small quantity generators, then that jurisdiction increases its liabilities and costs, that should then be passed on to the generators who bring the materials to the jurisdiction's facility.

11.7 Collection Methods

The following describes the strategies various jurisdictions use to collect HHW from the public.

11.7.1 Single Day Event

Single day events are the norm among the counties in the State of Hawaii. Single day events used to be the norm on the mainland but are increasingly being phased out for more service-oriented collection methods discussed below.

Jurisdictions initiated the collection of HHW tepidly through the use of single day collections. A jurisdiction would hire a firm that specializes in HHW collection. A site would be selected, usually at a landfill or a paved parking lot located at a utility company. The event would be publicized, for example, on a Saturday morning for anyone living in the jurisdiction sponsoring the collection to come and drop off a prescribed list of materials. Vehicles often would line up waiting to unload their inventory of material. Each customer would be greeted, checked for residence, and perhaps given a flyer to explain the virtues of replacing toxic items with non-toxic material. One of the technicians working for the specialty firm would wave for the next car to drive up so its materials could be withdrawn from the vehicle.

Stacks of material would be around the contractor's processing tables waiting to be carefully examined. The scene at these events was often chaotic and costly in terms of the expensive labor it took to handle limited volumes of material that may not be in the quantity needed to make shipping of the material efficient. Half drums of batteries or pesticides, for example, would be shipped and the sponsoring agency would be charged for the disposal of a full drum of material.

Single day events necessarily provide a limited chance to reuse the material brought in simply because of the narrow window of time within which the event is conducted. At the end of the day, all the material has to be processed, packaged, and manifested for shipping.

11.7.2 Permanent HHW Facilities

In the 1990s, jurisdictions increasingly moved from collection events to fixed facilities in order to handle smaller amounts of material on a daily basis and throughout the course of the year. Permanent facilities allow the jurisdictions to accumulate enough material to decrease the unit management cost. Public labor began to replace the more expensive contracted labor. These public employees were trained to interact with customers, separate the material into the appropriate categories, segregate materials that can be recycled from those that need to be destroyed, and pack the remainder of the material with larger quantities for more cost efficient transportation.

Transportation of this material, however, was still conducted by a specialized HHW firm.

A permanent facility provides significant options to a jurisdiction, and can, in the end, lower overall costs of the program. A permanent facility extends storage of material thereby increasing opportunities for consolidation of like material. A permanent facility allows for the potential to recycle and reuse material that would otherwise be destroyed. The cost aspects are discussed in more detail in 11.9.2.

A permanent facility also provides a consistent service to the public by providing more dependable and regularly available times to drop material off.

Photo 11-1. HHW facility in Metro Portland, Oregon

11.7.3 Mobile Collection

A mobile HHW collection program is designed for the collection service within a prescribed geographic area. Generally, these are made up of a crew of trained workers, in a single box truck or a truck and trailer, who travel to certain locations at publicized times and dates to receive material from citizens who otherwise would not drive into the fixed facility. This is the "bookmobile" form of HHW collection most widely used as a supplement to fixed facility collection programs. The County's Solid Waste Resource Advisory Committee (SWRAC) toured Metro Portland's fixed facility, which also operates a mobile collection unit.

As with the single day event form of collection, a jurisdiction must find a site with adequate space and public accessibility. It must provide advertising and public education so that the users will know the time and location of the events. Crews must be trained and have the tools to handle any spills that may occur at the site.

A new trend of mobile HHW collection is the "door-to-door" service. By appointment, a resident can set a time for a crew to come to their house and collect the HHW material directly. Sometimes there is a fee for this special and personal collection activity.

11.8 SWRAC Tour

Members of the SWRAC and County staff toured three HHW facilities: the Metro Regional Authority in Portland, Oregon; the City and County of San Francisco, California; and Monterey, California. The following section reviews the findings of the site visits of these three different jurisdictions.

11.8.1 Metro Portland Regional Authority in Oregon

The Metro Portland Authority (Metro) has been operational since 1979 and is charged with the area's comprehensive regional planning, conservation policies, operating the area's zoo, convention center, and the disposal of the area's solid waste. Its membership is made up of 25 cities and three counties.

Metro's strategy to collect HHW material from the public is a combination of permanent and mobile collection. It has two permanent facilities, each located at transfer stations, collecting 4.5 million pounds (2,250 tons) of HHW a year from approximately 58,000 customers. This represents nearly 10 percent of the jurisdiction's households. Each of the permanent facilities is open 312 days a year. Metro conducts 35 mobile events with an average of 159 customers per event.

Photo 11-2. Metro's recycled paint facility

Customers drive in under the canopy where Metro employees ask the customer the nature of the materials. These employees take the materials out of the vehicle, place them on a cart, and wheel them into the facility where they are processed and bulked for shipment.


Photo 11-3. Paint at the HHW facility


Photo 11-4. Filling of recycled paint into Metro's five-gallon can

In 2004, each customer brought in, on average, 78 pounds. The cost for Metro to operate the collection, processing, and transportation of each pound was $0.85. The annual total gross cost of the program for 2004 was $3,484,800.

One of the distinctive features of Metro's HHW program is its strategy for handling latex paint. This commodity amounts to approximately 30 percent of most HHW programs' material, is not hazardous, and is the most costly of the material to handle simply because of its volume. Metro made the decision in 1992 to begin recycling its own paint products into new paint and to market these commodities.

Photo 11-5. Mixing colors of paint at Metro Paint

The facility now processes approximately 1.9 million gallons of latex paint a year. Over 1.1 million gallons are donated to various community projects. The response to the products made Metro decide to move its operations into a custom-designed facility in August 1999, and then into an expanded facility in the spring of 2005.

The SWRAC toured Metro's latex paint facility and saw the Metro employees sort the variety of colors and filter the paint, and observe the quality controls in place to assure consistent color and viscosity.

The Metro paint program has 51,000 paying customers for the 740,000 gallons sold, capturing an estimated five percent of the Portland area latex market. These sales have yet to cover Metro's full cost of the program but do help to reduce the overall costs of the program.

11.8.2 San Francisco, California

San Francisco City and County (SF) services the HHW needs of approximately 800,000 people. The jurisdiction provides one drop-off facility operated by a contractor and partners with 100 private entities for type-specific drop-off service such as batteries and motor oil.

Photo 11-6. A San Francisco contractor collecting HHW from a residence

The unique feature of SF's program is its home collection of material. Residents can have used motor oil, oil filters, and latex paint picked up at home at no charge. For $35, residents can have a home collection of typical HHW material such as oil-based paint, pesticides, solvents, and antifreeze. If the resident is disabled or elderly, the $35 fee is waived and the collection occurs at no charge to the resident. All collection work is done by contractor.

11.8.3 Monterey, California

The Monterey Regional Waste District (District) was formed in 1951. It services the needs of 18 incorporated and unincorporated areas for a total population of 170,000 people. It operates numerous waste handling facilities on a 475-acre property.

Photo 11-7. Monterey's reuse facility

Its HHW facility is open Monday through Saturday from 8 am to 4:30 pm and is operated and managed by the District's employees. It takes 62,248 gallons of material from over 9,000 customers a year. Over a third (21,955 gallons) of the material is reused, with 11,202 gallons of oil, 1,121 gallons of antifreeze, and 42 tons of car batteries recycled. Over 60 percent of the material collected is diverted from disposal.

The unique feature of the District's HHW operations is its reuse of the material that is brought in by the public. The HHW facility is located across from the District's Last Chance Mercantile which is a facility that has material for customers to purchase that otherwise would have gone into the landfill. HHW products that have the potential to be reused are placed in the Last Chance Mercantile for people to take and use in their homes and businesses.

11.9 HHW Trends

11.9.1 HHW in Hawaii

There are four counties in the State of Hawaii. Only Maui County does not have a broad, multi-material HHW collection program that is County-sponsored. Three Counties (Hawaii, Kauai, and Honolulu) have implemented event collection strategies with the same contractor, EnviroServices. The contractor performs all related work for these collections except educating the citizens as to the time, date, and location. These are the responsibilities of the respective Counties. Table 11-1 compares the programs among the four Counties.

Table 11-1 – Comparison of HHW Program in Hawaii (FY 2006)

Program Elements	Hawaii County	Kauai	Honolulu	Maui
HHW Collection	Yes	Yes	Yes	No
Type	Event	Event	Event/Fixed	None
Number of collections	5	4	6	0
In-house/Contractor	Contractor	Contractor	Contractor	Neither
Contractor's Name	EnviroServices	EnviroServices	EnviroServices	None
Amount Spent	$186,760	$75,000	Unknown	None
Fixed Facility	No	Developing	Yes	No
Small Quantity Generator Program	No	Developing	No	No

EnviroServices is located on Oahu and uses its location as a drop-off point for the City and County of Honolulu. For Kauai and Hawaii Counties, the contractor travels to those locations, sets up collection events staffed with its people, and packs the material using pallets, barrels, and shrink wrap to ship back to its facility on Oahu. The material is then further processed and economically packed for shipping in an overseas container to Portland, Oregon, where it is sent to a disposal point.

An estimated 40 percent of the contractor's fees to the jurisdiction is allocated to setting up for the events. The remaining portion of the fee is for processing the material, lab packing, and shipping to a final disposal point.

11.9.2 HHW on the Mainland

Metro Portland conducted a study[4] of 25 communities across the country regarding their respective HHW operations. Some general observations can be made from the results:

- The median percentage of households served was 7 percent.
- The median level of pounds per participant was 75.

[4] "Comparison of HHW Programs" by Metro Solid Waste and Recycling Department, Fall 2005; also reviewed was "Sonoma County HHW Programs Benchmarking and Program Evaluation" by Sonoma County Waste Management Agency, January 2007. The latter examines targeted facilities within California and the former examines targeted facilities across the country.

- The median number of permanent facilities is two, operating 250 days a year, with 79 participants per day.
- More than two-thirds of HHW programs offer mobile collection events with a median of 17 operation days per year and 161 participants per day.
- Median costs were $55 per participant and $0.67 per pound.
- The ten most cost-efficient programs were operated in-house with public (as opposed to contracted) labor.

The data from the survey shown in Table 11-2 below suggest that those programs that are operated by in-house employees rather than contracted employees are more efficiently operated.

Table 11-2 - Annual Cost Comparison of In-house and Contractor-operated HHW Programs

Program Type	Median Total Program Cost	Median Cost Per Pound HHW	Median Cost Per Participant	Median Pounds Per Participant
In-house	$465,320	$0.48	$39	78
Private Contractor	$1,635,816	$0.82	$72	72

Table 11-3 illustrates the general assertion that HHW programs with public in-house labor are more efficient than contractor-operated HHW programs. The ten lowest (cost-per-pound) programs in the table below are in-house operated. Also, the largest programs are not always the cheapest or the most effective.

The programs that have a lower cost per pound and a relatively high percentage of households served are generally managed by hands-on managers. For example, the Big Lakes Regional HHW Program in Kansas was formed by Pottowatami, Riley, Marshall, and Morris Counties to combine their efforts to collect HHW under the umbrella of the Big Lakes Regional Council. Governed by a board made up of three elected officials from each participating county, the Regional Council assesses fees on participating counties and is eligible for grants. The organization determined that it would be less expensive, through economies-of-scale, to perform the HHW tasks as a single entity.[5]

This rural regional program in northeast Kansas maintains a multi-county program through 25 mobile collection events and fixed drop-off points with a central HHW facility where the material is consolidated and prepared for shipment by in-house labor and shipped via a single contractor. Mr. Gary (Red) Yenzer has been doing the mobile collection and consolidation since the program's start in the early 1990s. He manages all procurements for shipment, materials packing, and culling material out of the HHW waste stream that has a revenue source or local reuse value. He has kept costs to $0.21 a pound, the lowest in the survey.

[5] Joining Forces on Solid Waste Management: Regionalization Is Working in Rural and Small Communities, United States Environmental Protection Agency, October 1994: PP: 27-28.

Table 11-3 – Benchmarking Study Listed in Order of Cost per Pound

2004 Data						
Program Location	**Service Area Population**	**Estimated Households**	**Program Type**	**Total Participants**	**% HH Served**	**Cost Per Lb**
Big Lakes Regional HHW Program, KS	184,000	74,000	In-house	4,979	7%	$0.21
Spokane, WA	480,000	195,000	In-house	34,632	18%	$0.22
Larimer County, CO	283,000	112,000	In-house	16,319	15%	$0.23
Alachua County, FL	240,000	103,000	In-house	24,380	24%	$0.28
Sedgwick County, KS	500,000	198,000	In-house	14,413	7%	$0.36
Palm Beach County, FL	1,300,000	556,000	In-house	68,160	12%	$0.39
Sarasota County, FL	340,000	160,000	In-house	9,523	6%	$0.45
Pinellas County FL	1,000,000	350,000	In-house	15,737	4%	$0.48
Snohomish Co., WA	638,000	241,000	In-house	16,483	7%	$0.53
Shawnee County, KS	171,000	72,000	In-house	1,589	2%	$0.56
Los Angeles Co., CA	4,000,000	1,342,000	Contractor	62,800	5%	$0.57
Orange County, CA	3,056,865	1,013,842	Contractor	90,100	9%	$0.63
Ada County, Boise, ID	350,000	135,000	Contractor	17,000	13%	$0.67
San Bernardino County, CA	1,786,187	567,000	In-house	36,720	6%	$0.69
Dane County, WI	400,000	169,000	In-house	8,621	5%	$0.71
Hennepin County, MN	1,139,837	477,000	Contractor	99,596	21%	$0.73
Anchorage, AK	260,000	90,000	Contractor	16,245	18%	$0.80
Chittenden Solid Waste District, VT	150,000	61,000	In-house	10,371	17%	$0.83
Metro Portland, OR	1,400,000	553,000	In-house	52,813	10%	$0.85
King County (except Seattle), WA	1,173,626	491,000	Contractor	30,385	6%	$0.85
Regional Solid Waste Association, CA	720,000	264,000	Contractor	10,841	4%	$0.90
Santa Clara Co., CA	1,600,700	594,000	Contractor	23,861	4%	$1.15
Montgomery County, MD	1,000,000	376,000	Contractor	11,530	3%	$1.23
Santa Barbara Co., CA	312,700	112,000	Contractor	10,665	10%	$1.28
Seattle, WA	600,000	288,000	In-house	16,400	6%	n/a

11.9.3 Case History: Metropolitan Government of Nashville and Davidson County, Tennessee

HHW programs can realize significant cost reductions. A case in point is the Metropolitan Government of Nashville and Davidson County (Metro) that services a population of 570,000 people. Although larger than the County of Maui, the tactics

used to bring costs down may be implemented in any new program the County should institute.

The Metropolitan Government of Nashville and Davidson County in Tennessee had an HHW operation that closed its doors before the middle of fiscal year 2000 because it had gone drastically over budget and spent its budgeted $293,000 in 24 operating hours.

The facility reorganized by, first, training its Metro employees to take over the work of the contractor. It designated one manager of the facility to evaluate, search, and implement tactics to lower costs. The manager sought materials and supplies from competitive sources instead of through the HHW contractor. Employees were trained in HHW so they could help off set times of the week when the flow of material was heavy and thereby keep overtime to a minimum. Incoming materials were packaged in bulk so as to maximize shipping space.

These changes resulted in a lower cost per vehicle (from $185 down to $21), total cost dropped from $293,000 to $150,000, annual days of service went from 6 to 361, and tons collected rose from 100 to nearly 400 per year (bringing the cost per pound down from $1.45 to $0.26).

11.10 Resource List

Table 11-4 presents a list of useful resources for future reference.

Table 11-4 – HHW Resource Contacts

Resource Contacts of Programs	Web Address
North American Hazardous Materials Management Association	http://www.nahmma.org/index.cfm
Office of Waste Management, University of Missouri Extension	http://outreach.missouri.edu/owm/hhw.htm
United States Geological Survey for information on contaminants	http://toxics.usgs.gov/regional/emc/
Dept of Toxic Substance Control listing of websites	http://ccelearn.csus.edu/mercurylamp/content/resources5.htm
Product Stewardship Institute	http://productstewardship.us/
Product Policy Institute	http://productpolicy.org/
Latex Paint Information	http://www.ciwmb.ca.gov/ConDemo/Paint/
Amazon Environmental, Inc. Latex Paint Recycling	http://www.nvo.com/amazon
Rechargeable Battery Recycling Corporation	http://www.rbrc.org
International Metal Reclamation Company	http://www.inmetco.com/
ReCellular for used cellular phone recycling	http://www.recellular.net
Curbside Inc.	http://www.curbsideinc.com/

11.11 Electronic Waste (E-Waste)

11.11.1 Background

Used electronic products are the most rapidly growing waste problem in the world, due to their quantity, rapid obsolescence, and toxicity. The National Safety Council estimated that more than 300 million computers became obsolete in the United States in 2004. The International Association of Electronics Recyclers projects that 1 billion computers will be scrapped worldwide by 2010, at a rate of 100 million units per year. Further, the federal legislation overseen by the FCC requires conversion of all television broadcasting to high definition by February 2009. This will make obsolete most analog television sets if they are not connected to a cable system with a converter.

Electronic wastes contain toxic substances, including lead, mercury, cadmium, lithium, brominated flame retardants, and phosphorous coatings. These toxic materials can be released upon disposal, posing a threat to human health and the environment. Inconsistencies in worker safety and environmental protection mean potential liability concerns for those sending electronics to recycling facilities – especially if these facilities are located in developing countries. In addition, domestic recycling markets for some collected materials are not fully developed.

Since the late 1970s, electronic items are increasingly being discarded. Cell phones, televisions, and computers, to name a few products in this category, are being disposed of in landfills. Many of these items have material in them that is hazardous to our environment. Cathode ray tubes (CRTs), for instance, are used in color computer monitors and televisions. CRTs contain lead that is hazardous and can be released when the monitor and television is compacted and broken up. Lead is but one example of a hazardous element used in electronics. They also can contain mercury, beryllium, cadmium, nickel, and zinc. Together, these items can fail the Toxicity Characteristics Leaching Procedure (TCLP) test for heavy metals. For these reasons of environmental health, communities are implementing electronic collection systems even though they can be costly and not a regulatory requirement.

Consumer demand for electronics has reached such heights that local and state jurisdictions are seeking collection and disposal methods to handle this growing commodity.

11.11.2 E-Waste Collection in Hawaii

None of the counties in Hawaii has an E-waste collection that is operated and managed by County employees. Instead, these counties coordinate E-waste collection activities as a partner with non-profit entities, as follows:

- The County of Hawaii has a twice-a-year program where citizens can bring old computers, monitors, keyboards, and other computer equipment as well as televisions, VCRs, and stereos. The program is called CompuCycle. The material is placed in overseas containers and shipped to a processor in California.

- The County of Kauai has no electronic recycling program for computers, televisions, cell phones or any electronics. It does accept these materials generated by both households and commercial entities for disposal in its landfill

- The City and County of Honolulu banned large quantity commercial generators from disposing E-waste in the landfill. Large quantity commercial generators must seek recycling alternatives while household and small quantity generators are exempt from that provision and may, if they choose, dispose of electronic waste in their trash.

  Although the County and City of Honolulu has no program for collecting and recycling E-waste, there are many non-government entities that will take E-waste either for free or for a fee. Some of the entities below will collect electronic material at the home or business for a fee.

  - Pacific Commercial Services LLC: 808-545-4599
  - EnviroServices & Training Center: 808-839-7222
  - Haztech Environmental Services: 808-671-1985
  - Island Recycling: 808-845-1188
  - Lenox Resources, Inc.: 808-682-5539
  - SD Systems Inc.: 808-836-7950
  - Hawaii Open Source Education Foundation: 808-689-6518 www.hosef.org
  - Aloha Computers for Education in Samoa: (no phone number) www.aces-somao.org
  - Computers to Classrooms: 808-521-2259
  - T&N Services: 808-371-0281

- The County of Maui partners with non-profit groups with grants of money for the collection of computers and other electronics that contain circuit boards from households and businesses. The program has been successful both in the quantities of material and in the volunteer activism.

The County of Maui partners with non-profit groups with grants of monies for the bi-annual collection of computers from households and businesses. The program has been successful both in the quantities of material and in the volunteer activism. These collection days are located on Maui Island using approximately ten overseas containers whereby non-reusable items are shipped to a processor on the mainland. Volunteers will often greet the customers coming into the site, ask survey questions, and direct the customers to off-loading points. Volunteers triage then unload the material and segregate out the items that can be rebuilt or that work at the time. These are taken over to an adjacent facility where volunteer technicians work on the machines as the event proceeds. The non-profit group has a distribution system to transport reusable computers to organizations or individuals in need.

11.12 Trends

Waste managers are increasingly concerned about electronics in the waste stream. There appear to be three developing trends: First, professional associations joining together to foster new policies; second, banning of material from landfills; and third, product stewardship. Each trend is discussed below.

11.12.1 Joining Together

Several professional associations dealing with this waste have joined together to call for 100 percent electronic recycling in 10 years and tax credits to consumers,

manufacturers, retailers, and recyclers to assist in this activity. The associations are: the Integrated Waste Services Association, National Recycling Coalition, National Solid Waste Management Association, and the Solid Waste Association of North America.

11.12.2 Banning

In the last few years, several states have begun to ban material from being disposed in landfills within their borders. Massachusetts banned E-waste in the year 2000. Maryland has a temporary ban of material for five years which ends in 2010. Here is a list of the bans by state:

- Arkansas banned E-waste from being disposed in 2008.
- California banned Cathode Ray Tubes in 2001 and E-waste in 2006.
- Maine banned E-waste in 2006.
- Maryland banned E-waste in 2005.
- Massachusetts banned E-waste in 2000.
- Minnesota banned E-waste in 2006.
- New Hampshire banned E-waste in 2007.
- Rhode Island has slotted E-waste to be banned in July 2008.

11.13 Product Stewardship

Members of the SWRAC tour made visits to both Portland, Oregon, and San Francisco, California, to see firsthand examples of jurisdictions representing a growing number of communities that want to see states pass product stewardship legislation. Such legislation is an outgrowth of a growing partnership among manufacturers, retailers, environmental groups, federal agencies, as well as state and local governments, which, at its core, directs all participants involved in the life-cycle of a product to take shared responsibility for the impacts to human health and natural environment that results from the production, use, and end-of-life management of the product.

Product stewardship has helped manufacturers assume responsibility for the impacts of a product and its packaging, the energy and materials consumed, air and water emitted, the amount of toxics in a product, worker safety, and waste disposal in product design and end-of-life management.

Some manufacturers demand this kind of product stewardship among its subcontractors. Henry Ford had such consumer leverage with a company that made his transmissions for the Model T that he could demand that they be delivered in a box made of tongue and groove pine wood of a certain length, width, and thickness. Although the contractor could not understand the demand, the contract was so important that he complied. Ford used the wood as the floor boards for his car. Ford, in other words, managed the packaging and product design for reuse.

As of October 2007, nine states have implemented various forms of product stewardship. Eight of the nine, as Table 11-5 shows, emphasize producer responsibility, whereby the producers provide for the means to fund for a portion of or all the cost associated with collection, transportation, and disposal. California, however, has chosen to implement an advanced recycling fee directly to consumers on products such as televisions and monitors.

Table 11-5 – Brief Comparison of State Laws on Electronics Recycling

	Maine	California	Maryland	Washington State	Minnesota	Texas	Oregon	Connecticut	North Carolina
Type of Program	Producer Responsibility	Advanced Recycling Fee (Consumer Fee)	Producer Responsibility	Producer Responsibility	Producer Responsibility Based on market share	Producer Responsibility	Producer Responsibility Based on return share	Producer Responsibility Mostly return share	Producer Responsibility
When law passed	2004	Sept 25, 2003	2005	2006	**Signed on May 8, 2007**	**Signed on June 15, 2007**	**Signed on June 7, 2007**	**Signed on July 6, 2007**	**Aug 31, 2007**
Program Start Date	January 2006	January 2005	January 2006 Expires 2010.	January 2009	August 2007	Sept 1, 2008	Jan 1, 2009	Jan 1, 2009	Jan 1, 2009
Scope of Products Covered	TVs, monitors, Laptops. Doesn't cover CPUs unless attached to monitors.	TVs and Monitors only. NOT CPUs or other products. Bill in play currently to add CPUs.	Monitors, computers (CPUs), laptops. **Televisions were added in 2007.**	TVs, monitors laptops, and desktop computers	Scope for figuring mfgr obligation: video display devices (TVs, monitors, laptops). Scope for free collection: TVs, monitors, laptops, desktops, printers, keyboards; fax machines; and DVD players	Desktops, laptops, monitors, but NOT televisions	TVs, monitors, personal computers, laptops	TVs, monitors, personal computers, laptops	Desktops, laptops, monitors, keyboards, mice NOT televisions In 2011, the State will look at adding printers to the scope.
Whose products are recycled for free?	Households only	All owners – consumer and business	Not specified	Consumers, charities, small businesses, schools and small governments.	Consumers	Consumers	Households, small businesses, small non-profits and anyone dropping off 7 items or less to collection points	Consumers or any resident dropping off 7 or fewer products at once	Not specified.
Who pays for collection,	Producers pay for	Consumers pay a fee at	Counties pay for	Producers pay for	Producers pay for collection,	Producers pay for	Producers pay for	Producers pay for	Producers must pay for
transportation, recycling?	transport and recycling and some collection costs. Municipalities pay for some collection costs.	purchase. Fee money goes to state, used to reimburse recyclers and collectors.	everything. They can apply for local grants from the state program. This is a modest 5 year pilot program.	collection, transportation, and recycling.	transportation, and recycling.	collection, transportation, and recycling.	collection, transportation, and recycling.	transportation and recycling. Municipalities arrange for collection and transportation to recyclers, Recyclers bill the manufacturers	transportation from collection sites (run by govt, retailers, or non-profits) as well as recycling costs. They don't pay for collection.
Goals or targets for collection	None	Bill set goal to eliminate electronic waste stockpiles and legacy devices by December 31, 2007	None	None	Year 1: Manufacturers must recycle amount equal to 60% of what they sold by weight in previous year Year 2+: 80% of previous year sales	None	None	State will establish statewide collection goals By Oct 2010	None
Language on Toxic Materials?	None	Comply with RoHS Directive on heavy metals. Companies can't sell laptops, monitors, TVs, portable DVD players that exceed RoHS levels for Lead,Mercury, Cadmium, and Hexavalent chromium.	None	None	Disclosure. Companies must report on display devices sold to households if they exceed the maximum ROHS levels for lead, mercury, cadmium, hexavalent chromium, (PBBs),(PBDEs)	None	None	None	None
Prohibition on use of prison labor?	No	No	No	Yes	Yes, except for non-profit refurbishment	Indirectly.	No	No	No
					and reuse activities				
Disposal ban?	Yes	Was already in place	No	Not in bill, but some counties have passed bans	Was already in place	No	Yes	Yes, landfill ban effective 2011	Yes, landfill and incinerator ban as of Jan 2012

Source: Computer TAKEBACK Campaign, www.computertakeback.com, Sept. 19, 2007

Several of the states in the table belong to the Northwest Product Stewardship Council (NWPSC) which is an alliance of government organizations that works with businesses and nonprofit groups to integrate product stewardship principles into policy and

economic structures in the Pacific Northwest. 13 federal, state and local government representatives comprise its steering committee from Oregon and Washington. Besides electronics, the NWPSC advances a program of pharmaceutical take-back projects as well as paint and mercury take-back initiatives.

Out of NWPSC's initiative, Washington State passed an Electronic Product Recycling Law where the product manufacturers self-fund recycling services throughout the state at no charge to the production owner. There is no state tax or fee charged to the consumer at the point of purchase or end life of the product. The products covered, as stated in the table, are computers, monitors, laptop computers, and televisions. The law will be implemented in January 2009.[6]

The time needed for Washington to implement this plan spanned two years. In January 2007, the manufacturers had to register and pay fees to the state for overhead and enforcement costs. In June 2008, these same manufacturers had to either combine their efforts in the Materials Management and Financing Authority where monies are pooled together to pay for collection, transportation, and disposal, or each company had to submit their own respective plan on how it would carry out the program and fulfill the goals of the legislation.

Every approved plan under the Washington law must provide free collection, transportation, and processing to any household, charity, school district, small business, or small government located in the state. There must be one collection point in every county and, at minimum, one in every city where the population is 10,000 or more.

A unique element to the Washington plan is its encouragement of high performance. The companies that recycle more of their products will be compensated by the under performing plans when the program goes through a financial reconciliation at the end of the year. This is seen as an equalization that creates an incentive to those manufacturers that have not achieved a high level of recovery.

11.14 Sharps

11.14.1 Background

Sharps refer to needles, syringes, and lancets. There are three billion needles placed in the trash each year by nine million consumers of these products in the U.S. As the country's population continues to age, these numbers are expected to increase.

In 2004, EPA recommended that sharps be handled separately from MSW because of the possibility of waste industry workers getting injured from these items. Sharps also become a problem when discovered in the recycling stream by unaware workers who may get jabbed and possibly infected by the needles.

Waste Management Inc., a garbage and recycling collection firm, contracted with the Product Stewardship Institute to begin, in November 2007, a project involving government agencies, medical professionals, Veteran Associations, sharps

[6] Washington Law 70.95N RCW; website for the Materials Management and Financing Authority is www.wammfa.com .

manufacturers, and the waste hauling community to develop an action plan to find solutions to this growing problem.[7]

11.14.2 Sharps Programs in Hawaii

The State of Hawaii recommends that all household-generated sharps be placed in rigid, strong plastic or metal containers with a screw-on or tightly secured cap, such as a laundry detergent bottle. The container must be marked "Do not recycle" and "Household sharps." The container should then be filled with one part bleach solution to ten parts water and let the sharp soak for 20 minutes. The fluid is poured out and the bottle sealed. Commercially-generated sharps (e.g., from clinics and hospitals) are required to be rendered non-infectious prior to disposal. No county in Hawaii has a specific sharps collection program, and sharps are currently landfilled.

11.14.3 Mainland Programs

Communities have begun to provide public drop-off points for sharps. These are at public facilities or at the location of partners, usually medical in nature, such as pharmacists or community medical assistance agencies, and the jurisdiction has a collection route that switches out the container and takes the contents to the landfill.

1. Marin County, California, has a program with County-supplied containers where citizens can dispose of sharps that are in a rigid container. Marin County partners with the following entities for both locations for collection and financial support:

    - Marin County Pharmaceutical Association
    - City of San Rafael Fire Department
    - Marin Recycling Center
    - Marin's Household Hazardous Waste Program
    - Kaiser Permanente
    - Marin General Hospital
    - Novato Community Hospital
    - American Diabetes Association
    - American Association of Diabetes Educators
    - Marin County Health & Human Services
    - Marin County Environmental Health Services
    - Marin County Solid & Hazardous Waste JPA
    - Marin Medical Society
    - PMX Medical
    - California Integrated Waste Management Board

[7] PSI has an 11-member governing board made up of seven representatives from state environmental agencies and four representatives from local environmental agencies. Scott Klag, who spoke to the SWRAC Research Tour members in Portland, Oregon, is a member of this board.

2. Kitsap County, Washington, also provides containers at public locations such as its HHW facility. The County's solid waste personnel maintain a collection route where the container is switched out. Citizens go to these public facilities, place their sharps in a rigid container, and deposit it into the designated bin.

Photos 11-8 and 11-9. The containers for the sharps program are not expensive but must be highly visible so as to reduce accidents.

11.15 Plan Recommendations - HHW

11.15.1 Goal

The Division's goal is to develop long-term facilities and collections to receive toxic substances from households and small-quantity generators in a cost-efficient manner.

11.15.2 Strategy

The Division will implement a strategy that will see the hiring of a HHW manager, building of a permanent HHW facility, the contracting of a HHW disposal company, and event collections in the Hana region and the Islands of Lanai and Molokai.

11.15.3 Description of Recommended Strategy

The Division will implement a household hazardous waste collection program for all three inhabited islands and the Hana region in the County. A fixed facility will be centrally located on the Island of Maui; the Division will fund a full HHW manager who will oversee the development of this program. The HHW program will have event collections on the Islands of Lanai and Molokai as well as in the Hana region. The fixed or permanent facility will be open daily for people to use on a regular basis.

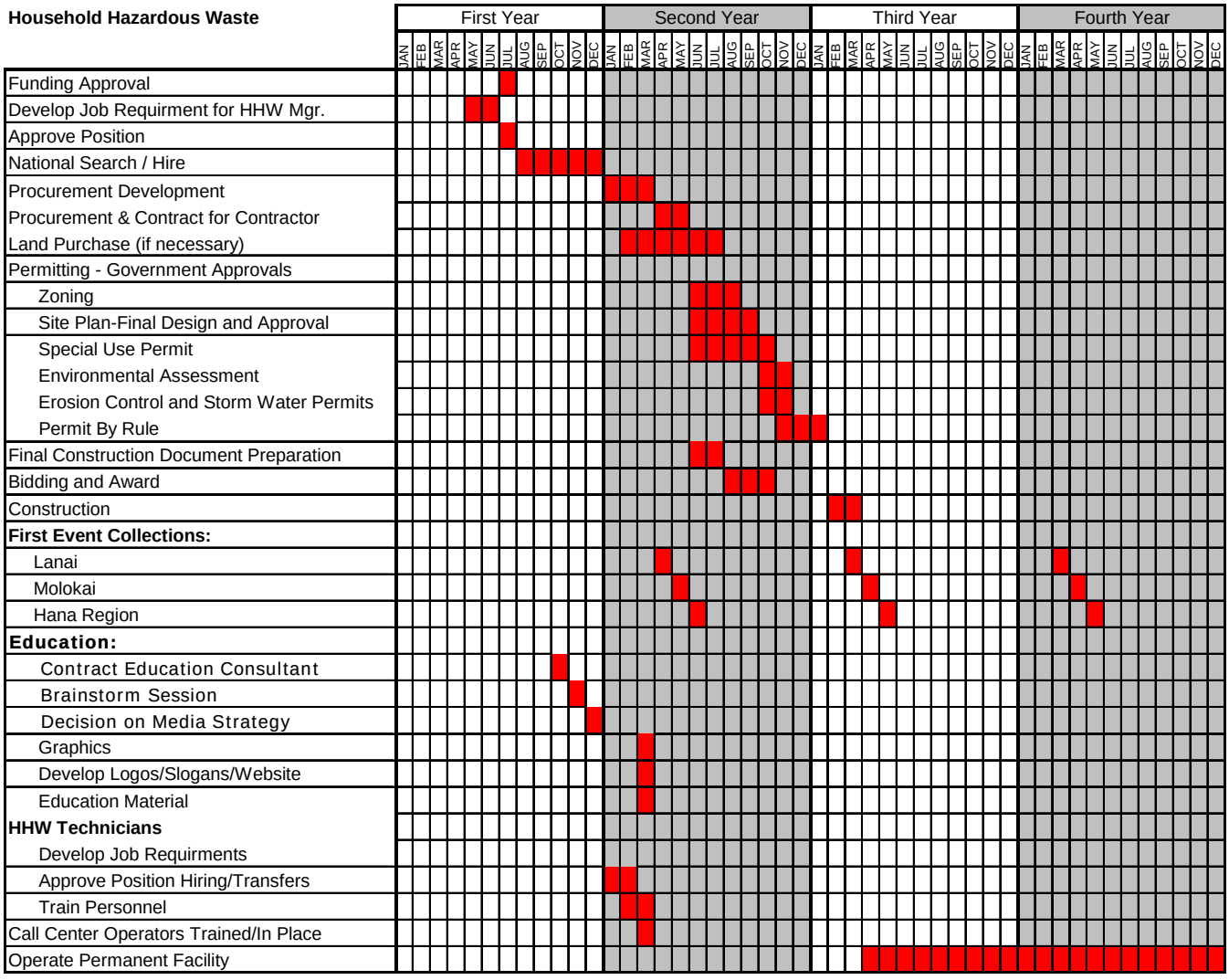
As the personnel become more efficient with the handling of this material, the facility will progress from being open three days a week to six. At a point to be determined by the HHW manager, the permanent facility will begin to receive material from small quantity generators by appointment and for the full cost of the services.

The HHW services will be fully supported with education which will also advance the substitution of non-toxic material for the hazardous material. The fixed facility will develop a reuse function to it so as to divert as many materials as possible away from disposal.

11.15.3.1 Tactics to Achieve the Strategy

- Hire a trained and experienced individual as an HHW manager;
- Procure for a HHW disposal firm;
- Site and build HHW facility;
- Train a core of Division employees to assist in HHW activities;
- Conduct annual collection events in the Hana region, Lanai, and Molokai;
- Open permanent facility three days a week using Division employees to process the material and get it ready for shipping; and
- Augment operating days to six per week and begin receiving material from small quantity generators on an appointment basis charging them for the full cost of the services.

11.15.3.2 Implementation Timeline



11.16 Plan Recommendations - Electronic Waste

11.16.1 Goal

The Division desires to work with non-profits, other Hawaiian counties, the State, and the producers of electronic material to develop cost-efficient methods to handle and process electronic waste.

11.16.2 Strategy

The Division will continue to support the non-profit sector in handling the E-waste material as it currently does. As the HHW facility further develops, the volunteer effort may grow to receive material at that facility. The Division will work with other Hawaiian counties, the producers of electronic items, and the State to develop and pass product stewardship legislation whereby the producers must work and financially assist in the efforts of the counties to receive, process, and transport this material to an end user.

11.16.3 Implementation Timeline

The E-waste grant program to non-profit groups is an ongoing operation. After the Council endorses this plan, the Division should begin networking with representatives from other Hawaiian counties and the State to build a coalition supporting product stewardship. It should seek the assistance of established organizations on the mainland to aid in this endeavor. This will be an ongoing process to draft statewide legislation for producer responsibility of E-waste.

11.17 Plan Recommendations - Sharps

11.17.1 Goal

Educate the public on the proper disposal of sharps so as to minimize the risk of accidents.

11.17.2 Strategy

The Division will develop an education awareness campaign for residential generated sharps to place on its website, at its HHW facility, and distribute to medical facilities.

11.17.3 Implementation Timeline

The Division can implement this education campaign within four months of initiation. When the HHW facility is open to the public, brochures can be provided to that location and be handed out during collection events in Lanai and Molokai as well as the Hana region.